Amendments to the Claims

Please amend the claims without prejudice. The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

1. (Currently amended) A method for determining a downhole parameter in a drilling environment, comprising:

activating, by an activation device ~~(6)~~, drilling fluid flowing past the activation device;

turning off the activation device ~~(6)~~ for a time sufficient to create an unactivated slug of drilling fluid;

detecting the unactivated drilling fluid slug at a known distance (d) from the activation device ~~(6)~~; ~~and~~

determining a time-of-flight (t) for the unactivated drilling fluid slug to travel the distance (d)<u>; and</u>

<u>calculating borehole volume over the distance (d) using a known surface volumetric flow rate</u>.

2. (Original) The method of claim 1, further comprising calculating drilling fluid velocity from the time-of-flight (t) and the known distance (d).

3. (Original) The method of claim 2, wherein calculating the fluid velocity includes using a rate-of-penetration correction.

4. (Canceled)

5. (Currently amended ) The method of claim <u>1</u> 4, further comprising calculating a borehole diameter from the borehole volume.

6. (Original) The method of claim 1, further comprising calculating a downhole volumetric flow rate from the time-of-flight (t) and a known borehole volume.

7. (Previously presented) The method of claim 1, wherein the method is performed using a logging-while-drilling tool.

8. (Previously presented) The method of claim 1, wherein the fluid flowing past the activation device is flowing toward a surface location.

9. (Previously presented) The method of claim 1, wherein the unactivated drilling fluid slug is detected using a gamma ray detector located in a drill string tool the distance d from the activation device.

10. (Original) The method of claim 1 wherein the distance d is chosen such that the unactivated drilling fluid slug is detected within about 30 seconds from when it passes the activation device.

11. (Currently amended) A tool for determining a downhole parameter in a drilling environment, wherein the tool is adapted to be placed in a drill string and wherein the tool comprises a activation device ~~(6)~~ and a gamma ray detector ~~(7)~~ separated along a drill string axis thereof by a distance (d), the tool further comprising:

control circuitry to turn off the activation device ~~(6)~~ for a time sufficient to create an unactivated slug of drilling fluid flowing past the tool; ~~and~~

processing means ~~(17)~~, coupled to the gamma ray detector ~~(7)~~, for determining when the unactivated slug of drilling fluid flows past the gamma ray detector ~~(7)~~; and

wherein the processing means is configured to calculate borehole volume over the distance (d) using a known volumetric flow rate.

12. (Original) The tool of claim 11, wherein the processing means further determines a time-of-flight (t) for the unactivated drilling fluid slug to travel the distance (d).

13. (Original) The tool of claim 12, wherein the processing means is configured to calculate drilling fluid velocity from the time-of-flight (t) and the known distance (d).

14. (Canceled)

15. (Currently amended) The tool of claim 11 ~~14~~, wherein the processing means is configured to calculate a borehole diameter from the borehole volume.

16. (Original) The tool of claim 12, wherein the processing means is configured to calculate a downhole volumetric flow rate from the time-of-flight (t) and a known borehole volume.

17. (Previously presented) The tool of claim 11, wherein the tool comprises a logging-while-drilling tool.

18. (Previously presented) The tool of claim 11, wherein the fluid flowing past the activation device is flowing outside the tool.

19. (New) A method for determining a downhole parameter in a drilling environment, comprising:

activating, by an activation device ~~(6)~~, drilling fluid flowing past the activation device;

turning off the activation device ~~(6)~~ for a time sufficient to create an unactivated slug of drilling fluid;

detecting the unactivated drilling fluid slug at a known distance (d) from the activation device ~~(6)~~; ~~and~~

determining a time-of-flight (t) for the unactivated drilling fluid slug to travel the distance (d); and

calculating a borehole diameter from the borehole volume.

20. (New) A method for determining a downhole parameter in a drilling environment, comprising:

activating, by an activation device, drilling fluid flowing past the activation device;

turning off the activation device for a time sufficient to create an unactivated slug of drilling fluid;

detecting the unactivated drilling fluid slug at a known distance (d) from the activation device;

determining a time-of-flight (t) for the unactivated drilling fluid slug to travel the distance (d); and

calculating a downhole volumetric flow rate from the time-of-flight (t) and a known borehole volume.

21. (New) A method for determining a downhole parameter in a drilling environment, comprising:

activating, by an activation device ~~(6)~~, drilling fluid flowing past the activation device;

turning off the activation device ~~(6)~~ for a time sufficient to create an unactivated slug of drilling fluid;

detecting the unactivated drilling fluid slug at a known distance (d) from the activation device ~~(6)~~; ~~and~~

determining a time-of-flight (t) for the unactivated drilling fluid slug to travel the distance (d); and

calculating drilling fluid velocity from the time-of-flight (t) and the known distance (d), wherein calculating the fluid velocity includes using a rate-of-penetration correction.